

Session 7B: Emerging Issues

Questions & Answers

Ronald Thom

Q: I had a comment first and then a question. The comment was on the shell mitigation stuff in Grays Harbor and just in deference to the Army Corps of Engineers. They do try and avoid eelgrass most of the time anyhow with the shell, because they realize that dumping a big thick layer of shell on eelgrass does kill it. And the other one was I was curious about how much of that...when it recovers...is there any of that due to seed recovery, is it all rhizome stuff?

A: We don't know. Just the way the plants grow in these plots it looks to me like it's not seeds at all. It's all rhizome. But in Grays Harbor it's different because on the flats there is a lot more flowering that goes on. And I think recruitment on those warm flats in the summer time is a lot...a large part is seeds. It's more like an annual population on those flats.

Q: Also in Grays Harbor, I thought I heard you say you were sent to the failed site against your better judgment and the agencies thought this was the better site, why did they send you there?

A: It was Eagle Harbor. Eagle Harbor was marginal and there were probably better sites and there were a variety of reasons that they wanted to use this site. I wasn't involved in the discussions so do not know the reasons for the site being chosen.

Q: I am hoping you will speculate why there is no eelgrass beyond Nisqually in South Sound given what you have said about controlling factors and algae blooms and other controlling factors. We thought you might have some ideas?

A: This really comes from a study done in Long Island Sound, and we think, but we don't know, it's related to tidal factors and further in the southern Sound the tidal amplitudes get really great and what controls the upper limit of eel grass is desiccation. It doesn't like to dry out. What controls the lower depth is light, and so you have this tidal amplitude pushing the upper end down, you have turbidity in South Sound pushing the lower end up, so you get to a point where it squishes it out, it doesn't have any area to grow, so I think it is related to light and desiccation, but it could be some other factors too. The temperature may be an issue too. That would be a working hypothesis.

Q: Have you experimented with different planting patterns in terms of density or in terms of regular grid of individual plants or just clumping?

A: Yes, we have done a little bit of that and the strategy now they are using on the East Coast because crabs are a real problem, they have four species of crabs that screw things up and what they are trying to do is that they are planting in dense clumps, almost like a sod, to try to escape from this disturbance by density and that might be the way to go, we are thinking about that.

Q: Originally, when the plants were put into the tank to eventually transplant those back out at transplant sites, do you now feel that the value of having them in the tank then following them over a longer period of time outweighs putting them back out into the field again?

A: As much as I'd like to say, we really need to use those to those are stockpiles of plants at Clinton, they were taken from Clinton where they were going to be destroyed by the widening of the terminal, and we were going to put them back, we really have to use them for that, but it's been a fascinating study to look at the population dynamics in a controlled situation.

Teresa Ryan

Q: Do you have a sense on whether the harvesting methods were changing?

A: We do have a significant amount of cultural change among indigenous people, but the methods of weaving they are being taught, and there is a revival of a lot of the traditions that may not have been practiced as extensively as they were before. They were not lost, they are still practiced, but as people are learning these skills, they are learning the appropriate method such as gathering...My mother and I spend time teaching the correct methodology of harvesting material, and there is a specific methodology to harvest, and it is inappropriate to cut the combs. The reason that you want to pop it out is because you want to preserve the integrity of the entire comb so it is something that is important, but I do believe the traditional methods of gathering are maintained.

Q: I found use of the four indigenous seagrasses in the region primarily through literature searches. We have heard a lot today about lack of databases over time and especially with respect to global climate change issues and wondered if you could address just little bit about the relationship between traditional ecological knowledge and some of those concerns?

A: The traditional ecological knowledge and global climate changes is very important because if we see an impact that will be severe and sudden, which is possible and within our lifetime, we can consider that severe and sudden as opposed to centuries of change. For example, if we see a one-meter rise in sea level, the salt marshes we know will not exist and they...we completely lose that natural resource that has been used for centuries, so climate change is a very important factor in addressing the natural resources that we utilize in nearshore habitats.

Tracy Collier

Q: Have we done work on the interactive effects between temperature and toxicants? Case in point being the Cherry Point area and the high temperatures found concomitant with some of the reduction in population?

A: We have not studied it in the way it's been studied somewhere in the laboratory situations, not by us very much. It hasn't been studied by us in this robust field approach we would like to employ. One of the questions we have for salmon and pesticides is: pesticides effect on the neural system maybe in fact related to their ability to distinguish thermal refugia and therefore they may be inappropriately going into temperature regimes. It is strictly a hypothesis at this point, but that is one of the things we would like to answer.

Q: How did you account for early deaths in terms of looking at the ages and how the ages of the fish were affected?

A: We have some studies looking at mortality at different age terms and Lyndal Johnson is definitely the expert on this. We don't see big effects on some of the mortality curves in these different sites. What we are looking for is really just reproductive output and so the presumption in the reproductive output model that Lindal put together I believe is that there is not this mortality component in early death in the younger age classes. It is just this combination of precocious maturation and delayed maturation.

Q: Can you briefly talk about why you expect laboratory studies to show less impact than a field study?

A: In one regard, the laboratory says it will show more impact related to specific contaminants and certainly because you can have control over that. The issue of a laboratory study and not being able to show the multiple stressors that occur in the field and also the length of time; when we do the field studies we are looking at animals that have been exposed to most of their life cycle to contaminants. So the question we are looking at is: what are the cumulative effects of these ultra conditions over the life cycle and in the laboratory? You can do it and we are trying now to develop a short-term model. We are accelerating that

process, but again, it's going to be subject to the criticism it's not going to be a Puget Sound marine fish but we can't have it all.

Scott Redman

Q: I'd like to make a few observations about your first point about the shoreline modifications/armoring and finish up with where I think we really need some of the research attention. In 1991-92, when I initiated, through the Department of Ecology, my Puget Sound Coastal Erosion Management Strategy, at that time, I contracted with a consortium of CH2M Hill and Battelle for a study partly on the physical and biologically ecological effects of shoreline armoring. Ron Thom was one of PIs from the Battelle side, Keith McDonald from CH2M Hill, and what we found at that point was that we had a fairly good grip on the physical impacts much less so than the biological and ecological. I think we ought to go to that framework for understanding what we thought the problems were and the difficulty we ran into, especially in the biological and ecological, was that we didn't really understand how that ecotunnel along the shoreline works. What is the relationship between overhanging vegetation, large woody debris. What's the role of large woody debris on marine beaches compared to our knowledge about it in riverine systems. But that sets some things in motion. And then to bring it into the present, there's now a consortium with State Fish & Wildlife, Department of Ecology, State Department of Transportation working on some aquatic habitat guidelines largely for salmon habitat protection restoration, and we have contracted again for another suite of the State-of-the-Knowledge papers on marine shoreline modifications as well as marine shoreline over-water structures. We are in the final stages of revealing those and those will be published in April. And again, we have made these incremental advances on both sides, the physical and biologically logical, but we are still stuck there and an imperfect understanding of what those ecological relationships are for that nearshore, that ecotunnel under there. I think that's where the...because that is the stumbling block. That's where I think a lot of the research emphasis needs to go. The other thing is that determining through a traditional scientific research methods with the impacts of the shoreline modifications are is really tricky because in our experience, so far, it takes decades for those impacts to emerge at the physical level. And then, infusing that into biological and ecological is really a stretch and the question I pose is: given those constraints in our ability to fund this kind of research, what is the best way to approach that?

A: I don't know how to answer that question.

Q: That's an unfair question, Scott, because it's more of a rhetorical question. Because we all know that given the framework we have to operate with, there is no way to get at a direct answer.

A: All I would say is let's just stop saying the words "cumulative impacts," and let's start finding a way to study cumulative impacts. Let's just stop saying "synthesis" and do it.

Q: We could have a conversation on the side about cumulative impacts because I know it is possible to do it. It's just that most people who set out to do it squander at least half their time trying to figure out what they are.

Q: In terms of looking at the most recent trends in contaminants, Alan Mearns gave a nice talk but one of the neatest datasets that the Corps has taken of the Puget Sound that were actually taken in the mid-80s. You can track contaminant trends, and I think that if we can take another series of cores and look at the more recent stuff, it would be a wonderful record to look at.

A: I don't know if Maggie Dutch is still in the audience but Maggie coordinates the sediment component for PSAMP, and we are actually trying to find a way through PSAMP or through some other work at the Department of Ecology to find another set of cores. Those cores I think were taken in 1991, so if we got them done this year we would be a decade later. The prior work, I think, has been very valuable.

Q: My question is kind of related to that. I was wondering if you could comment briefly on what trends you have seen in the 10 years of PSAMP sediment data that you do have?

A: The study design for PSAMP sediments and PSAMP fish contaminant has not really allowed us to detect any trends. Now whether that is a study design limitation or there's not been much change, I don't know. PSAMP monitors the top two centimeters of sediment. I think our best record would be English sole and that's a rather a long-lived species to see trends over a 10-year period only. So I think the answer there is we have not seen a lot. We've relied, like Alan, on mussel-watch data. Mussel watch in Puget Sound shows declining concentrations. That's sort of water-based concentrations. We need better models for how to monitor the sediment, just giving one suggestion and Sandy and Jim are working on herring monitoring. It's a better model, I think, for the fish component.

Q: If you look at the rates of decline from the cores now, you can pretty much see what to expect in terms of sediment changes in the future and it's a long haul in terms of declines. So over a 10-year period you probably won't see statistically significant except by chance, changes. But I was going to comment on, is there some way we can all get together under your aegis or whatever, to go ahead and do a synthesis collectively? A two, three day get together or maybe over a period of a year where different people can put their new conceptual models together and actually do the work of a new conceptual model for the Sound or portions of it?

A: I have noted that, and I'll see what we can do.

Tom Mumford

Q: I found this a very stimulating series of presentations and I am wondering if we are failing to take into account lags. Alan Mearns made the comment yesterday that, gee you know we have spent all this effort cleaning up, and it's a lot cleaner now than it was 20 to 30 years ago, and yet we are aware of a lot more populations that are in trouble. And I wonder if some of those subtle sub-lethal effects took 20 to 30 years or we needed some particular climatic condition. I mean I can hear a lot of politicians or a lot of people saying was it a waste of money to go to all that effort to clean up. I mean the PCB declines in concentration, and we are leaving ourselves very vulnerable if we are not aware if we don't go back and study those history things. It may very well be that it take 30 years for a population to recover and also our perception that we always focus on the populations that are in trouble so that I did not hear whole a lot of success stories about the money spent in the last 20 to 30 years cleaning up are leading to some populations being healthier. It is sort of a "woe is me," and we need infinite detail to understand these things but lags can be very disruptive. I mean if we expect to see instantaneous betterment of natural populations and we fail to see that, maybe we better go back in history and look at what kind of lags are realistic.

A: In the salmon recovery field certainly the issue of lags is one that is a big deal to us because now that the ocean conditions are improving, a lot of the managers and politicians are saying, it's working, we can ease off a little bit. Those of us that are scientists know that's the biggest fallacy, and we are all trying to avoid it. Whether we can do it remains to be seen. But I would point to Mark's poster, and the Eagle Harbor remediation is probably one of the best examples of one of the most studied sub-lethal effects in Puget Sound fish is with the liver disease. In fact, he is showing in the poster downstairs...he is showing roughly what the lags are. We know the age trends and development of diseases and in fact, we see a lag in improvements in their reduction and lesion prevalences after remediation, and it substantiates that relationship so in this case the lag is 5-7 years. Lags of a longer time period for recovery of an unhealthy population you'd expect a longer time lag, but I agree entirely, again we have to focus on the forests and the trees in the forest, and we are now looking at the surrounding landscapes. In goes the other way too, we were just talking about the fact that a shoreline modification takes years and years for the effects to show up so it goes both ways.

Q: The Bernie wearing those sneakers is County Commissioner, or he was at one point, and he lives there, he knows his watershed address, he knows where his temporal spaces and spatial spaces in the watershed in Chesapeake. Who do we have out here who's taking that kind of ownership?

A: I think that's an interesting question and it kind evolves around the talk that went on in here at noon. Do people have his sense of place, and that's a cultural question almost. It does take a sense of place and there is some that do and others that don't. Where does that reside, and I think it needs to reside in all of us and

would offer to Chesapeake that has done a much better job of that than we have here in terms of making everybody feel that sense of place. The iconic salmon, I think, comes as close to anything to this.

Q: I really respect Curt Ebbesmeyer a lot, and the first morning we were here....and Kurt just loves Puget Sound...he knows a whole lot about it and he's kind of moping around and I said, What's wrong Kurt? You should be happy. There's 785 people registered for this meeting, and he said, Yeah, I see all these people, but why isn't something happening? He said, Three years I gave a talk that the southern Puget Sound was dying and nothing's happened. I didn't have a good comeback, my comeback was, there are some communities that are very interested in seeing recovery like Anacortes and others, but I just wanted to point that out.

Q: I like what you said about learning from examples and from others, and I have tried to apply that myself and have run into a brick wall a lot times. Commencement Bay is not like Duwamish. Puget Sound is not like the East Coast. How can we apply that knowledge to our situations and have people accept it?

A: One is that the signs are pretty much the same. Maybe everybody should take a field trip, let's go to the Baltic and go for a swim. I spent time in Thailand looking at coastal estuaries and let me tell you I came back here very grateful for what we do but also horrified at what can happen in a place where you have uncontrolled logging that basically filled the whole bay full of silt in matter of years. It was horrible. So, the signs are the same. The other thing that they have done...Chesapeake is good example...there has been a huge effort there to get everybody tuned in and think about this and to be concerned as a group, and I think we are beginning to see that here, but we have a ways to go though.